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## Patent Abstracts of Japan

PUBLICATION NUMBER : 10281484  
PUBLICATION DATE : 23-10-98

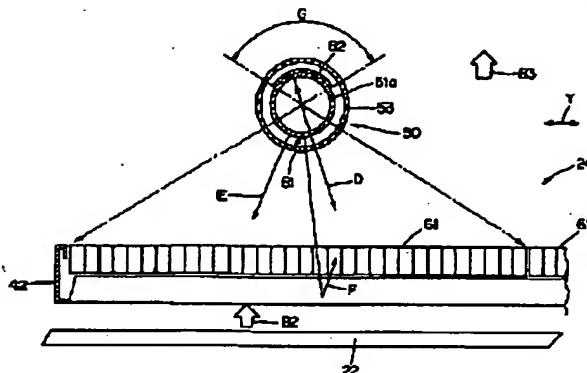
APPLICATION DATE : 31-03-97  
APPLICATION NUMBER : 09081495

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INT.CL. : F24F 1/00 A61L 9/20 // B01J 35/02  
B01J 35/04 B01J 35/06

TITLE : AIR CLEANER



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**SOLUTION:** An air cleaner is applied to the photodeodorizing unit 24 of an air conditioner. A reflection member 52 supported by an outer shell member 51a is provided along the surface of a cylindrical glass pipe of the outer shell member 51a of a light source 51 comprising a cold cathode tube. The reflection member 52 can reflect the light of the light source 51 toward a photocatalyst element 61 and efficiently light it. The reflection member 52 may be a reflective adhesive tape such as an aluminium tape or an aluminium deposited surface. In this case, a thin reflection member 52 is provided on the surface of the outer shell member 51a. Accordingly, even when the light source 51 and the reflection member 52 are arranged in an air duct, the increase of air duct resistance can be prevented. As a result, a driving sound can be reduced. In such a way, a structure can be simplified.

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(11)Publication number : 10-281484

(43)Date of publication of application : 23.10.1998

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(21)Application number : 09-081495 (71)Applicant : DAIKIN IND LTD

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### (54) AIR CLEANER

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To require no exclusive support member, which is required separated, since a reflection body is provided for directing light from a light source to a photocatalyst in an air cleaner using the photocatalyst.

**SOLUTION:** An air cleaner is applied to the photodeodorizing unit 24 of an air conditioner. A reflection member 52 supported by an outer shell member 51a is provided along the surface of a cylindrical glass pipe of the outer shell member 51a of a light source 51 comprising a cold cathode tube. The reflection member 52 can reflect the light of the light source 51 toward a photocatalyst element 61 and efficiently light it. The reflection member 52 may be a reflective adhesive tape such as an aluminium tape or an aluminium deposited surface. In this case, a thin reflection member 52 is provided on the surface of the outer shell member 51a. Accordingly, even when the light source 51 and the reflection member 52 are arranged in an air duct, the increase of air duct resistance can be prevented. As a result, a driving sound can be reduced. In such a way, a structure can be simplified.

## CLAIMS

[Claim 1] The photocatalyst which purifies a pollutant in response to the exposure of the ultraviolet rays included in light from the light source (51) is support (61a, 61b). It is supported and is an air air course (B-2, B3). In the air cleaner (24) which purifies the flowing air It is support (61a, 61b) about the light from the above-mentioned light source (51). It is the air cleaner which it turns, has the reflector (52) to reflect and is characterized by this reflector (52) being supported by the light source (51) so that it may meet on the surface of the light source (51).

[Claim 2] The photocatalyst which purifies a pollutant in response to the exposure of the ultraviolet rays included in light from the light source (51) is support (61a, 61b). It is supported and is an air air course (B-2, B3). In the air cleaner (24) which purifies the flowing air The protection member which wraps the perimeter of the light source (51), letting the light from the light source inside the above (51) pass (53), It is supported by the protection member (53) so that the front face of this protection member (53) may be met, and it is support (61a, 61b) about the light from the light source (51). Air cleaner characterized by having turned and having the reflector (52) to reflect.

[Claim 3] It is the air cleaner characterized by being prepared in the magnitude in which the above-mentioned reflector (52) can illuminate exactly the whole region of support (61a, 61b) by the reflected light from the reflector (52) concerned in an air cleaner according to claim 1 or 2.

[Claim 4] It is the air cleaner characterized by the above-mentioned light source (51) consisting of a cold cathode mold fluorescent lamp in an air cleaner given in any [ claim 1 thru/or ] of 3 they are.

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## DETAILED DESCRIPTION

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[0001]

[Field of the Invention] It is related with the air cleaner which can purify pollutants, such as a stinking component in air, using a photocatalyst.

[0002]

[Description of the Prior Art] From the former, the air cleaner equipped with the optical deodorization function is known (for example, publication-number 1-No. 234729 official report etc.). In such an air cleaner, when the ultraviolet rays emitted from the light source excite a photocatalyst, an odor component is decomposed and a smell can be removed.

[0003] In such an air cleaner, the photocatalyst is supported by the support arranged in the air air course, and the light source is arranged for example, in the air air course so that this support may be illuminated. By the way, in order to also illuminate the light which goes in the direction which does not have support in addition to the light which generally goes to support directly although the light source can be turned to an omnidirection and can emit light, it is possible to prepare the reflector which turns light to support and is reflected. For example, a reflector can consider it being supported by the tabular supporter material prepared in dedication, opening the light source and predetermined distance, and being arranged in an air air course.

[0004]

[Problem(s) to be Solved by the Invention] However, since it is in the inclination which structure complicates and also an air cleaner enlarges when the supporter material which opened the light source and predetermined distance and has been arranged is prepared in dedication, it is not desirable. Moreover, if such supporter material is prepared in an air air course, since air course resistance will increase, operation sounds, such as a whizzing sound, will also become large.

[0005] Then, the object of this invention is solving an above-mentioned technical technical problem, being able to attain small and high clarification capacity, and offering an air cleaner with a small operation sound moreover.

[0006]

[Means for Solving the Problem] The photocatalyst which purifies a pollutant in response to the exposure of the ultraviolet rays by which the air cleaner of invention which relates to claim 1 in order to attain the above-mentioned object is contained in light from the light source is supported by support, the reflector which turns the light from the light source to support, and reflects in the air cleaner which purifies the air which flows an air air course

is had, and a reflector is characterized by to be supported by the light source so that it may meet on the surface of the light source.

[0007] According to this configuration, the following operations are done so. That is, since a photocatalyst can be illuminated also by the light in which the light source was reflected from the reflector in addition to lighting a photocatalyst directly, a photocatalyst can be illuminated efficiently. And since it is not necessary to prepare separately the supporter material for supporting a reflector when the reflector is supported by the light source, structure can be simplified and it can attain space-saving. Consequently, it is small and the high air cleaner of clarification capacity can be realized.

[0008] Moreover, as a result of being able to prevent the increment in air course resistance also when the light source with this reflector has been arranged in an air air course since the reflector is made to have met on the surface of the light source, buildup of an operation sound can be prevented. In addition, an inner surface or an outside surface is sufficient as the front face of the light source where the reflector is supported. Moreover, since what consists of reflective film vapor-deposited by the front face of the light source besides reflexivity tapes, such as an aluminum tape stuck on the surface of the light source and a vacuum-plating-of-aluminium resin tape, as a reflector can be illustrated and a reflector can be made thin in any case, it is desirable to reduction of space-saving-izing and air course resistance.

[0009] In the air cleaner which purifies the air to which the photocatalyst which purifies a pollutant in response to the exposure of the ultraviolet rays included in light from the light source is supported by support, and the air cleaner of invention concerning claim 2 flows an air air course It is supported by the protection member so that the front face of the protection member which wraps the perimeter of the light source, letting the light from the internal light source pass, and a protection member may be met, and it is characterized by having the reflector which turns the light from the light source to support, and is reflected.

[0010] According to this configuration, the following operations are done so. That is, since a photocatalyst can be illuminated also by the light in which the light source was reflected from the reflector in addition to lighting a photocatalyst directly, a photocatalyst can be illuminated efficiently. And since it is not necessary to prepare separately the supporter material for supporting a reflector when the reflector is supported by the protection member, structure can be simplified and it can attain space-saving.

Consequently, it is small and the high air cleaner of clarification capacity can be realized.

[0011] Moreover, as a result of being able to prevent the increment in air course resistance also when a protection member with this reflector is prepared in the light source and this light source has been arranged in an air course since the reflector is made to have met the front face of a protection member, buildup of an operation sound can be prevented.

Moreover, since the protection member has covered the light source temporarily even if it is the case where the light source has been arranged in the air air course, it can control that the light source is cooled by the airstream of an air air course, consequently lowering of the skin temperature of the light source can be prevented. Therefore, since lowering of the illuminance of the light source can be prevented, as a result of being able to prevent lowering of the life of a lamp resulting from this illuminance lowering, the maintenance frequency of an air cleaner can be reduced.

[0012] Moreover, since a protection member can protect the light source, in case it detaches and attaches the light source from the body of equipment, it tends to treat the light source, consequently tends to maintain it. In addition, an inner surface or an outside surface is sufficient as the front face of a protection member where the reflector is supported. Moreover, since what consists of reflective film vapor-deposited by the front face of a protection member besides reflexivity tapes, such as an aluminum tape stuck on the front face of a protection member and a vacuum-plating-of-aluminium resin tape, as a reflector can be illustrated and a reflector can be made thin in any case, it is desirable to reduction of space-saving-izing and air course resistance.

[0013] Here, as a protection member, a wrap thing is sufficient also as what can cover the perimeter of the light source thoroughly in a part of light source. Moreover, as a protection member, the tubed part material which consists of a fluororesin, silicon resin, etc. can be illustrated. A reflector is characterized by being prepared in the magnitude in which the air cleaner of invention concerning claim 3 can illuminate the whole region of support exactly by the reflected light from the reflector concerned in an air cleaner according to claim 1 or 2.

[0014] According to this configuration, in addition to an operation of invention concerning claims 1 or 2, a photocatalyst can be illuminated much more efficiently. The air cleaner of invention concerning claim 4 is characterized by the light source consisting of a cold cathode mold

fluorescent lamp in an air cleaner given in any [ claim 1 thru/or ] of 3 they are.

[0015] A cold cathode mold fluorescent lamp is a electric-discharge lamp using glow discharge, and is a fluorescent lamp made to emit light from the fluorescent substance excited by the ultraviolet rays which operated in the normal-glow-discharge field and were generated with the positive column here. According to this configuration, since the cold cathode mold fluorescent lamp is not equipped with the filament in addition to the operation of invention concerning any [ claim 1 thru/or ] of 3 they are, generally compared with a hot cathode mold fluorescent lamp with a filament, it is small, consequently can consider as space-saving further. Moreover, since air course resistance is small and ends when arranged in the air air course, a small cold cathode mold fluorescent lamp can reduce an operation sound further.

[0016]

[Embodiment of the Invention] The desirable operation gestalt of this invention is explained referring to an accompanying drawing. Although the conditioner of the head-lining embedding mold which combined the optical deodorization unit with the function in which the photocatalyst as an air cleaner concerning 1 operation gestalt of this invention purifies a pollutant, and the indoor unit of an air conditioner with an air-conditioning function is explained below, this invention may be applied to an air cleaner only with the function in which a photocatalyst purifies a pollutant. Moreover, this invention is also applicable to the air cleaner of the type of those other than a head-lining embedding mold, for example, a floor type and a wall tapestry mold.

[0017] Drawing 1 is the schematic diagram showing the internal cross section of the conditioner of the head-lining embedding mold equipped with the optical deodorization unit as an air cleaner concerning 1 operation gestalt of this invention. In addition, the arrow head Y to show an arrow head X and a cross direction to show a longitudinal direction if needed in each following drawing is illustrated. Conditioner A is the so-called head-lining flush type, and has the body A0 of a conditioner containing the casing 1 arranged in underpart-of-the-roof space, and makeup panel unit A3 which is connected with the lower part and arranged in the head-lining side T. Inlet port 4 and an outlet 5 are formed in makeup panel unit A3. The air air course is formed in the interior of Conditioner A, and it is reached [ from inlet port 4 ] to the outlet 5 through the body of conditioner A0 interior.

[0018] The body A0 of a conditioner accumulates the indoor unit A1 of the air conditioner for air conditioning, and the air clarification unit A2 for a photocatalyst to purify a pollutant up and down, and is constituted. For this reason, casing 1 has the casing-upper half 11 contained in an indoor unit A1, and the casing lower half 21 contained in the air clarification unit A2 attached in the lower part of this.

[0019] Makeup panel unit A3 arranges the shield 31 to the inner circumference side of this panel 30 while arranging the rectangular-head annular panel 30 which is along the underside of casing lower half 21 in the head-lining side T. A shield 31 does not pass air, and it is formed so that light may not be made to penetrate. Moreover, the shield 31 has the hook to the both ends, and the hook of each edge is supported by the pivot 32 of the couple prepared in the panel 30 respectively free [ a revolution ]. The clearance between the edge of a shield 31 and the inner circumference edge of the panel 30 which counters this serves as above-mentioned inlet port 4, respectively. For example, inlet port 4 is extended and formed in the space perpendicular direction of drawing 1 . Moreover, the above-mentioned outlet 5 is formed in the side section of the couple of the panel 30 parallel to inlet port 4, respectively.

[0020] The air clarification unit A2 has the optical deodorization unit 24 using the photocatalyst for removing the stinking component in an aeration style, the air filter 23 for removing the comparatively big dust in an aeration style, the dashboard 22 for attaching an air filter 23, and the above-mentioned casing lower half 21. Casing lower half 21 has central opening 21a which was located above a shield 31 and inlet port 4, and was prolonged in the vertical direction, and outside opening 21b which was located above the outlet 5 and prolonged in the vertical direction. Outside opening 21b and central opening 21a are divided mutually. The optical deodorization unit 24 is arranged in the upper part in central opening 21a. It is the lower part of the optical deodorization unit 24, and the air filter 23 is arranged by the couple on both sides of the dashboard 22 above inlet port 4 and a shield 31.

[0021] The indoor unit A1 has the heat exchanger 12 of the couple for adjusting the temperature of an aeration style, the blower fan 13 for generating the aeration style from inlet port 4 to an outlet 5, and the above-mentioned casing-upper half 11 that holds a blower fan 13 and a heat exchanger 12. The casing-upper half 11 was formed in box-like [ with which the underside was opened ], and has divided a part of air air course to the interior. A casing-upper half 11 is the interior, and is opening central opening



21a of casing lower half 21, and outside opening 21b for free passage.

[0022] An air air course is an air course from inlet port 4 to [ passes along a blower fan 13 and a heat exchanger 12 in an air filter 23 and the optical deodorization unit 24, and ] an outlet 5 (refer to an arrow head B1 - B6). An air air course has the part (arrow heads B1-B3) which goes to the upper part which an aeration style reaches [ from inlet port 4 ] to a blower fan 13, the flection (arrow-head B4) which it is divided [ flection ] in a casing-upper half 11, and converts an aeration style into the reverse sense, and the part (arrow-head B5 - B6) to which an aeration style results in an outlet 5 and which goes caudad, and is an abbreviation inverted-L-shaped air course.

[0023] If a blower fan 13 is operated, while according to this conditioner A air will be inhaled from inlet port 4 (arrow head B1) and this air will flow an air air course, comparatively big dust is captured with an air filter 23, and pollutants, such as a stinking component, are purified by the optical deodorization unit 24 using a photocatalyst (arrow-head B-2-B3). And air conditioning is carried out by the heat exchanger 12, and air blows off from an outlet 5 (arrow-head B4 - B6).

[0024] This invention is applied to the optical deodorization unit 24. Hereafter, the optical deodorization unit 24 is explained to a detail.

Drawing 2 is the decomposition perspective view of the optical deodorization unit 24. The optical deodorization unit 24 equips the photocatalyst element 61 supported by the support of the shape of a honeycomb which mentions a photocatalyst later, and the photocatalyst element 61 with the light source 51 (refer to drawing 4 ) which irradiates ultraviolet rays. The light source 51 is included in the light source unit 50, and is attached in the rectangular-head annular upper housing 41 with the actuation circuit 59 which makes the light source 51 emit light. Under the light source unit 50, the lower housing 42 as the photocatalyst element 61 and a protection-from-light member and the sheathing 43 as a protection-from-light member are formed. Lower housing 42 had the underside section and the lateral portion which started from the periphery of the underside section, with the sponge 62 as an elastic member, is in the condition by which press energization was carried out, and has held it for the photocatalyst element 61 in the interior surrounded in a lateral portion and the underside section on the underside section, enabling free attachment and detachment. Lower housing 42 is supported by the lower part of upper housing 41 through the hinge 44 and the engagement tongue-shaped piece 45.

[0025] Within the optical deodorization unit 24, the column-like light source unit 50 is horizontally prolonged in the upper part, and it is arranged in it, and the photocatalyst element 61 levels a plate surface and is arranged at the lower part. As for the light source unit 50 and the photocatalyst element 61, every plurality, for example, two pieces, is prepared, respectively, and each light source unit 50 is located in the abbreviation central upper part of each photocatalyst element 61.

[0026] Moreover, the optical deodorization unit 24 is arranged between the deflection of an air air course, and inlet port 4. The parallel plate of two or more letters of dip is raised by the underside section of lower housing 42. It passes along opening of the started marks, and the aeration style of an air air course flows in in the optical deodorization unit 24 from a lower part. Then, an aeration style passes along the inside of the optical deodorization unit 24, it is penetrated so that the photocatalyst element 61 may be mentioned later, it passes along the perimeter of the light source unit 50, and flows out upwards through the annular inside of upper housing 41.

[0027] Moreover, the optical deodorization unit 24 has controlled the optical leakage by the lower part from the interior, letting an aeration style pass inside. That is, rather than the light source 51, lower housing 42 and a sheathing 43 cross an air air course to inlet port 4 approach, and are arranged. Lower housing 42 can interrupt the light from the light source 51 with the parallel plate of the letter of dip, letting air pass through above-mentioned opening of the marks started by the underside section. Consequently, the optical leakage from downward inlet port 4 can be controlled.

[0028] Moreover, in addition to the direct light from the light source 51, the photocatalyst element 61 is illuminated by the reflected light in the optical deodorization unit 24. That is, the reflector 52 mentioned later is formed in the light source unit 50, and the photocatalyst element 61 is illuminated by the reflected light by the reflector 52. Moreover, the reflector with gloss is established in the front face of the lower housing 42 by the side of the photocatalyst element 61. It is reflected in a reflector and light can illuminate the photocatalyst element 61 again, after penetrating the photocatalyst element 61. Therefore, air cleaning can be efficiently carried out with a photocatalyst.

[0029] Drawing 3 is the top view of the outline configuration of the photocatalyst element 61. The photocatalyst element 61 consists of a photocatalyst and support which supported this, and mutually, including much

parallel plate 61a and corrugated plate 61b arranged among the adjoining above-mentioned plate 61a, this support carries out the laminating of much these plate 61a and corrugated plate 61b by turns, and forms many air air courses in the shape of a honeycomb.

[0030] The photocatalyst element 61 can let many above-mentioned air air courses pass, and air can be passed, for example, air flows on a background from the space side front of drawing 3 . The photocatalyst element 61 is arranged so that an aeration style can pass the photocatalyst element 61 smoothly, and the direction where the laminating of plate 61a and the corrugated plate 61b is carried out by turns may intersect perpendicularly to an aeration style. Plate 61a and corrugated plate 61b consist of a raw material containing paper or paper.

[0031] The photocatalyst element 61 is supporting the photocatalyst which decomposes a stinking component in response to the exposure of ultraviolet rays a front face or inside plate 61a which constitutes above-mentioned support, and corrugated plate 61b. For example, you may make it support by applying a photocatalyst at least to one side of plate 61a and corrugated plate 61b. In this case, it is desirable to mix adsorbents, such as activated carbon and a zeolite, and to apply. It is because a photocatalyst decomposes it, adsorbing a stinking component physically with an adsorbent, so this deodorization capacity is maintainable over a long period of time while deodorization capacity is high.

[0032] In addition, the photocatalyst element 61 is not limited to an above-mentioned configuration. For example, the support of the shape of an above-mentioned honeycomb is not limited to what used corrugated plate 61b. Moreover, what coated fiber, such as a polyester system nonwoven fabric as support, with the photocatalyst may be used. Moreover, what wove others and activated carbon fiber yarn and catalyst yarn into the single sheet as a photocatalyst element 61 although the kneading object of a photocatalyst and an adsorbent was applied to the front face of a raw material sheet as mentioned above, and the thing which carried out the laminating of the sheet containing an activated carbon fiber and the sheet containing catalyst yarn can be illustrated. Above-mentioned catalyst yarn is yarn which consists of the catalyst itself, the yarn which supported the catalyst, or when possible.

[0033] A photocatalyst means the matter which light is absorbed [ matter ], and the energy is given [ matter ] to reacting matter, and makes a chemical reaction cause. By specifically receiving the exposure of light including

ultraviolet rays, the electron hole generated on the surface of the photocatalyst reacts with the water of adsorption on the front face of a photocatalyst, Radical OH (hydroxyl-group radical) is generated, and when this radical OH cuts the molecular binding of the organic substance, non-bromination of the stinking components, such as ammonia, is carried out.

[0034] Moreover, although it is possible to use as a photocatalyst the diacid-ized titanium ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), and tungstic trioxide which have the crystal structure of an anatase, it is the following point and it is desirable to use diacid-ized titanium. That is, it is because deodorization function sufficient also by weak ultraviolet rays can be demonstrated and the offensive odor of the wide range stinking matter, for example, ammonia, an acetaldehyde, an acetic acid, a trimethylamine, methyl mercaptan, a hydrogen sulfide, styrene, a methyl sulfide, 2 methyls thioether, and an isovaleric acid can be removed, if it is diacid-ized titanium.

[0035] Drawing 4 is the enlarged section front view of the edge of the light source unit 50. Predetermined spacing is opened into an air air course, and two are arranged at parallel so that the light source unit 50 may cross the annular interior of upper housing 41. The light source unit 50 is equipped with the above-mentioned light source 51 and the above-mentioned reflector 52 which reflects the light from this light source 51. The light source 51 is cylindrical and the cylinder-like protection member 53 has covered the perimeter. It protects the light source 51, this protection member 53 consisting of a raw material of a fluororesin, silicon resin, polyethylene resin, polyester resin, etc. which can make ultraviolet rays penetrate, and making ultraviolet rays penetrate. The both ends of the protection member 53 are held by the edge attachment component 54, respectively. And the protection member 53 and the light source 51 are mutually positioned by the same axle through the edge attachment component 54. The edge attachment component 54 has protected parts for a connection, such as soldering of the edge of the light source 51, and a feeder 55. It is being fixed to upper housing 41 through the stops 58 for \*\*\*\*ing and carrying out stop immobilization, the light source unit 50 holding the edge attachment component 54 (refer to drawing 2 ). Moreover, with the actuation circuit 59, the light source unit 50 is attached in upper housing 41, and constitutes the one-lighting unit.

[0036] The light source 51 is the cold cathode mold fluorescent lamp of a column-like straight pipe mold. It is the electric-discharge lamp with which the cold cathode mold fluorescent lamp used glow discharge here, and it is

the fluorescent lamp made to emit light from the fluorescent substance excited by the ultraviolet rays which operated in the normal-glow-discharge field and were generated with the positive column, and the wavelength of the light to emit can be changed by selection of the matter of a fluorescent substance. For example, it is desirable, when what emits light with a wavelength of 320-420nm activates photocatalysts, such as  $\text{TiO}_2$  and  $\text{ZnO}$ , and purifies a pollutant efficiently, and when losing the adverse effect to the body. Unlike the filament for which the electrode of a cold cathode mold fluorescent lamp was used with the conventional hot cathode mold fluorescent lamp, the member of the shape of tabular or a cylinder is used, and, generally the cold cathode mold fluorescent lamp is small and long lasting compared with a hot cathode mold fluorescent lamp. for example, a cold cathode mold fluorescent lamp is can also use a thing with a diameter of 1-5mm, and alike [ with a capillary ] compared with the hot cathode mold fluorescent lamp which is the diameter of about 15mm, and thin. Moreover, the life of a cold cathode mold fluorescent lamp is as long as 20,000 hours.

[0037] A reflector 52 can use the vacuum-plating-of-aluminium resin tape on which it consisted of an attachment tape, for example, the vacuum-plating-of-aluminium side as a reflector was formed in the front face of a resin tape, and reflexivity tapes, such as an aluminum tape. The reflector of a reflector 52 is supported by coat member 51a by being stuck on a peripheral face so that the peripheral face as a front face of the glass tube of the shape of a cylinder which is coat member 51a which constitutes the coat of the light source 51 may be met. Since a reflector 52 is formed in the concave bow side which consists of a periphery side when a reflector 52 meets cylinder-like coat member 51a, it can set up easily so that the light from the light source 51 may be reflected towards desired by the reflector 52, consequently light is effectively turned to the photocatalyst element 61, and it can reflect.

[0038] The reflector 52 is formed in the magnitude which can illuminate the whole region of the photocatalyst element 61 exactly by the reflected light from the reflector. For example, the reflector 52 is arranged on both sides of the light source 51 in the opposite hand of the photocatalyst element 61. The edge of a reflector 52 faces across the core of the light source 51, and it is arranged so that it may counter with the edge of the photocatalyst element 61. Moreover, the reflector 52 is formed along with the abbreviation overall length of the luminescence side of the light source 51.

[0039] Moreover, the reflector 52 has protection-from-light nature. The

light from the light source 51 can prevent progressing to the deflection of the air course which is behind a reflector 52, when interrupted by the reflector 52. Therefore, the optical leakage by the outlet 5 can be prevented. In addition, an inner surface or an outside surface is [ that the reflector 52 should just be supported by the front face of coat member 51a of the light source 51 ] sufficient as the front face. Moreover, if it is formed in coat member 51a of the light source 51 at another object and is attached by attachment etc., it will not be limited to an above-mentioned attachment tape, but since a reflector 52 can make a reflector 52 thin especially in the case of an aluminum tape and a vacuum-plating-of-aluminum resin tape, it is desirable to reduction of space-saving-izing and air course resistance. Moreover, since the reflector 52 may be formed by coat member 51a, vacuum evaporation, etc. in one and can make a reflector 52 much more thin in this case by them, it is desirable to reduction of space-saving-izing and air course resistance. For example, it is possible to make into the light source 51 the reflector mold fluorescent lamp which vapor-deposited aluminum to the inner surface of the glass tube which is coat member 51a of the light source 51, and formed the reflector as a reflector 52, and the fluorescent lamp which has a reflector as a reflector 52 which vapor-deposited aluminum to the peripheral face of the glass tube of coat member 51a.

[0040] Next, actuation of the optical deodorization unit 24 is explained with reference to the cross-section side elevation of drawing 5. Directly (arrow head E), it is reflected in the reflector of a reflector 52 and the light of the light source 51 is uniformly irradiated efficiently by the photocatalyst element 61 from the upper part indirectly (arrow head D). the reflected light reflected by the reflector 52 at this time -- the photocatalyst element 61 -- the whole region can be illuminated mostly. Consequently, in response to the ultraviolet rays from the light source 51, a photocatalyst is activated and purifies pollutants, such as an efficient stinking component.

[0041] Moreover, it is reflected in the reflector of the underside section of lower housing 42 (arrow head F), and the light which penetrated the photocatalyst element 61 irradiates the photocatalyst element 61 from a lower part. Consequently, a photocatalyst can purify pollutants, such as a much more efficient stinking component. On the other hand, since the light from the light source 51 is interrupted by the reflector 52, irradiating to the back (range shown by the arrow head G by drawing 5) of a reflector 52

is prevented. Consequently, the light included in the deflection of an air air course can be decreased, and the light which results to an outlet 5 can be decreased.

[0042] Moreover, since the light from the light source 51 is interrupted by the parallel plate of the underside section of lower housing 42, it can prevent leaking from the inlet port 4 which exists caudad. Thus, according to the gestalt of this operation, the following effectiveness is done so. That is, also by the light in which the light source 51 was reflected by the reflector 52 in addition to lighting a photocatalyst directly, since a photocatalyst can be illuminated, the utilization effectiveness over the photocatalyst of the light from the light source 51 can be raised, and a photocatalyst can be illuminated efficiently.

[0043] And since it is not necessary to prepare separately the supporter material for supporting a reflector 52 when the reflector 52 is supported by the light source 51, structure can be simplified and it can attain space-saving. Consequently, it is small and the optical deodorization unit 24 as a high air cleaner of clarification capacity can be realized. a reflector 52 meets the front face of coat member 51a of the light source 51 especially -- usually -- coat member 51a of the light source 51 -- the shape of a cylinder - - since it is spherical, light is effectively turned to the photocatalyst element 61, and it can reflect. And since a reflector 52 can be arranged most near the point of the light source 51 emitting light, it ends with space-saving.

[0044] Moreover, the light source 51 can be arranged in an air air course, being able to realize space-saving and preventing the increment in air course resistance, even if it forms a reflector 52 in the light source 51 in this way. Since it is not necessary to prepare supporter material separately in an air air course as mentioned above when arranging the light source 51 in an air air course, it can prevent that supporter material makes air course resistance increase. Therefore, compared with the case where supporter material is prepared separately, air course resistance can be reduced, consequently an operation sound can be reduced.

[0045] Moreover, as a result of being able to prevent the increment in air course resistance also when the light source 51 with this reflector 52 has been arranged in an air air course since the reflector 52 is made to have met the front face of the light source 51, buildup of an operation sound can be prevented. Therefore, an air cleaner with a quiet operation sound is realizable. Since a reflector 52 can be made thin when the reflector 52 is

especially formed in coat member 51a of the light source 51 in one, it is desirable to reduction of space-saving-izing and air course resistance.

[0046] Moreover, the magnitude of a reflector 52 can illuminate a photocatalyst much more efficiently by the reflected light from this reflector 52 by being the magnitude which can illuminate the whole region of the photocatalyst element 61 exactly. Moreover, since the light source 51 which consists of a cold cathode mold fluorescent lamp is not equipped with the filament, generally it is small compared with a hot cathode mold fluorescent lamp with a filament, consequently can be further made space-saving. Moreover, since air course resistance is small and ends when arranged in the air air course, a small cold cathode mold fluorescent lamp can reduce an operation sound further.

[0047] Moreover, since the reflector 52 which consists of an attachment tape can acquire a desired reflector easily by sticking the attachment tape set as desired magnitude, it tends to set up the reflector according to the magnitude which illuminates a photocatalyst, consequently can increase a design degree of freedom. Moreover, since the protection member 53 has covered the light source 51 even when the light source unit 50 has been arranged in the air air course, it can control that the light source 51 is cooled by the airstream of an air air course, consequently lowering of the skin temperature of the light source 51 can be prevented. Therefore, since lowering of the illuminance of the light source 51 can be prevented, as a result of being able to prevent lowering of the life of the light source 51 resulting from this illuminance lowering, the maintenance frequency of an air cleaner A can be reduced.

[0048] Moreover, since the protection member 53 can protect the light source 51, in case it detaches and attaches the light source 51 from the body 24 of equipment, for example, an optical deodorization unit, it tends to treat the light source 51, consequently tends to maintain it. In addition, with the gestalt of above-mentioned operation, although the light source 51 was the thing of a straight pipe mold, the configuration is not limited. For example, that in which the section was formed in the shape of crookedness, and the thing formed annularly may be used in the middle of a spherical thing. In such a case, a reflector 52 is also formed according to the configuration of the light source 51. Especially, when a reflector 52 is an attachment tape, the column-like light source 51 tends to stick the attachment tape 52, and is desirable.

[0049] Moreover, although an aeration style shall penetrate the



photocatalyst element 61, it is not limited to this. For example, the photocatalyst element 61 may be constituted by the raw material which does not penetrate the aeration style which supported the photocatalyst etc. In this case, the photocatalyst element 61 will be inclined to an aeration style, and will be arranged so that an aeration style may not be barred if possible. [0050] Moreover, with the gestalt of above-mentioned operation, although the protection member 53 was formed in the perimeter of the light source 51, the protection member 53 is also omissible. Moreover, with the gestalt of above-mentioned operation, although the reflector 52 was formed in the front face of coat member 51a of the light source 51, it is not limited to this. For example, as shown in the side elevation of drawing 6, a reflector 52 may be formed in the front face of the protection member 53. In this case, an inner surface or an outside surface is sufficient as the front face of the protection member 53. Moreover, as a reflector 52, an attachment tape and the thing which vapor-deposited aluminum to the protection member 53 may be used like \*\*\*\*.

[0051] Thus, since a photocatalyst can be illuminated also by the light in which the light source 51 was reflected from the reflector 52 by forming the reflector 52 in the protection member 53 in addition to lighting a photocatalyst directly, a photocatalyst can be illuminated efficiently. And since it is not necessary to prepare separately the supporter material for supporting a reflector 52 when the reflector 52 is supported by the protection member 53, structure can be simplified and it can attain space-saving. Consequently, it is small and the high air cleaner of clarification capacity can be realized.

[0052] Moreover, as a result of being able to prevent the increment in air course resistance also when the protection member 53 with this reflector 52 is formed in the light source 51 and this light source 51 has been arranged in an air air course since the reflector 52 is made to have met the front face of the protection member 53, buildup of an operation sound can be prevented. Moreover, by forming a reflector 52 in the protection member 53, the configuration of the light source 51 can form the protection member 53 in the configuration which is easy to set up the reflected light so that the photocatalyst element 61 may be turned to, also when not spherical, the shape of a cylinder, and.

[0053] And breakage of the light source 51 in the case of others can be prevented by the protection member 53 at the time of an assembly. Moreover, as a result of being able to prevent illuminance lowering through

preventing temperature lowering of light source 51 front face by the protection member 53, the substantial life of the light source 51 can be lengthened. Moreover, although the gestalt of above-mentioned operation explained the conditioner with the optical deodorization unit 24 with which a photocatalyst purifies a pollutant, when it constitutes as an air cleaner only with the function in which a photocatalyst purifies a pollutant, a heat exchanger 12 can be omitted.

[0054] Moreover, performing that the function in which a photocatalyst purifies a pollutant disassembles the pollutant which is not a stinking component besides deodorization by clearance of the stinking component mentioned above, sterilization of a microorganism, and inactivation of a virus etc. is included. That is, clarification of the air in this invention is removing the component in air harmful for human being. In addition, it is possible to perform design changes various in the range which does not change the summary of this invention.

[0055]

[Effect of the Invention] According to invention concerning claim 1, since the reflector was supported according to the light source, a photocatalyst can be illuminated efficiently, high clarification capacity can be attained, and, moreover, a small air cleaner can be realized through space-saving-izing by the simplification of the supporting structure. Moreover, since the above-mentioned reflector is made to have met on the surface of the light source, also when the light source with this reflector has been arranged in an air air course, the increment in air course resistance can be controlled. Consequently, it is small, clarification capacity is high, and, moreover, an air cleaner with a quiet operation sound can be realized.

[0056] According to invention concerning claim 2, since the reflector was supported by the protection member, a photocatalyst can be illuminated efficiently, high clarification capacity can be attained, and, moreover, a small air cleaner can be realized through space-saving-izing by the simplification of the supporting structure. Moreover, since the above-mentioned reflector is made to have met the front face of a protection member, also when the light source in which the protection member with this reflector was prepared has been arranged in an air air course, the increment in air course resistance can be controlled. Consequently, it is small, clarification capacity is high, and, moreover, an air cleaner with a quiet operation sound can be realized.

[0057] And breakage of the light source in the case of others can be

prevented by the protection member at the time of an assembly. Moreover, as a result of being able to prevent illuminance lowering through preventing the temperature lowering on the front face of the light source by the protection member, the substantial life of the light source can be lengthened. According to invention concerning claim 3, in addition to the effect of the invention concerning claims 1 or 2, the reflector of the magnitude which can illuminate the whole region of support exactly by the reflected light can illuminate a photocatalyst much more efficiently.

[0058] As a result of according to invention concerning claim 4 air course resistance is small and ending when arranged in the air air course since a small cold cathode mold fluorescent lamp can generally be further made space-saving compared with a hot cathode mold fluorescent lamp in addition to the effect of the invention concerning any [ claim 1 thru/or ] of 3 they are, an operation sound can be reduced further.

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## DESCRIPTION OF DRAWINGS

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[Drawing 1] It is the schematic diagram showing the internal cross section of the conditioner of the head-lining embedding mold equipped with the optical deodorization unit as an air cleaner concerning 1 operation gestalt of this invention.

[Drawing 2] It is the decomposition perspective view of the optical deodorization unit of drawing 1.

[Drawing 3] It is the top view of the outline configuration of the photocatalyst element of drawing 2.

[Drawing 4] It is the cross-section front view of the edge of the light source unit of drawing 2.

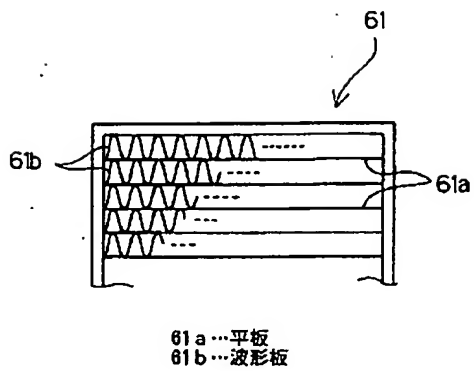
[Drawing 5] It is the cross-section side elevation of the optical deodorization unit of drawing 1.

[Drawing 6] It is the cross-section side elevation of the optical deodorization unit as an air cleaner concerning other operation gestalten of this invention.

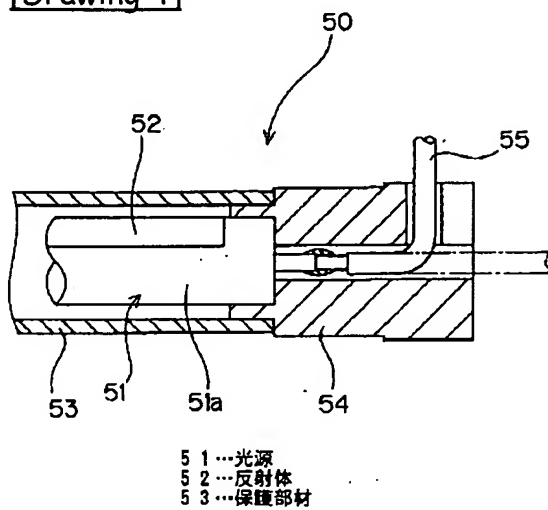
[Description of Notations]

Arrow-head B-2-B3 Air air course

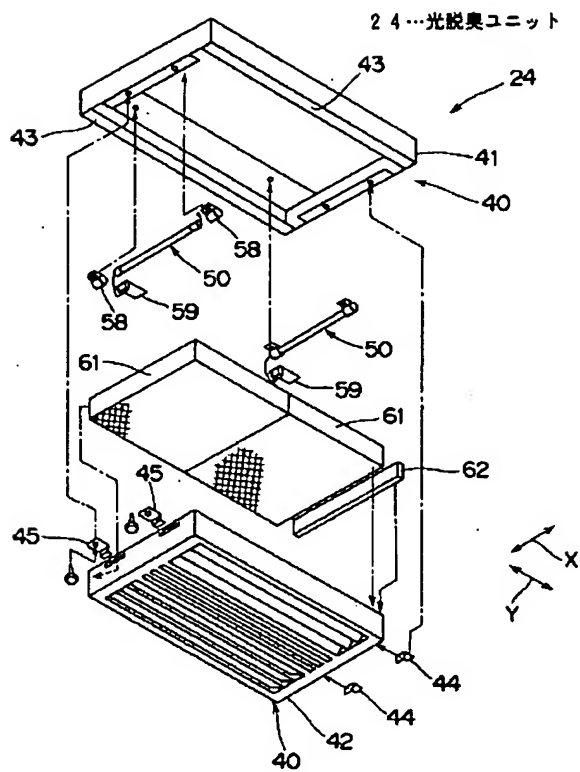
[Drawing 3]



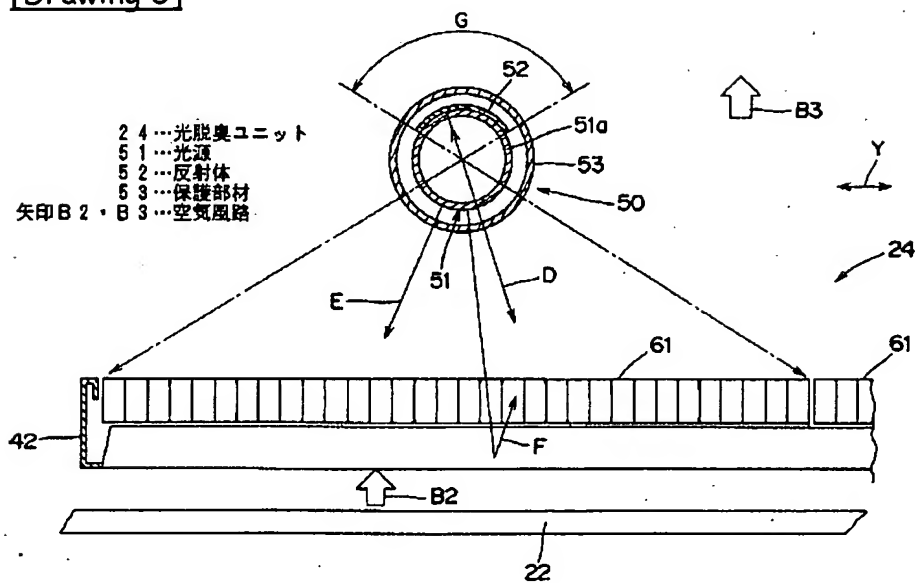
[Drawing 4]



[Drawing 2]



[Drawing 5]



[Drawing 6]

